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James V. Candy

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EXAMINER

KISH, JAMES M

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/661,249  
Filing Date: September 11, 2003  
Appellant(s): CANDY ET AL.

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Eddie E. Scott  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed November 12, 2008 appealing from the Office action mailed August 15, 2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed because a final rejection has not been made on the claims. The Office Action dated August 15, 2008 is a Non-Final Rejection.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

**REJECTION WITHDRAWN**

In the Office Action dated August 15, 2008, claims 4, 21, 41 and 61 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting in view of copending Application No. 11/904,823. This double patenting rejection has been withdrawn in view of the new ground of rejection below.

### **NEW GROUND(S) OF REJECTION**

Claims 4, 21, 41 and 61 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2, 14, 29 and 44, respectively, of copending Application No. 11/904,823, in view of Prada (Elsevier Sciences B.V.).

#### **(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

#### **(8) Evidence Relied Upon**

5,092,336	FINK	3-1992
2001/0037075	CANDY	11-2001

Prada et al. "Eigenmodes of the Time Reversal Operator: A Solution to Selective Focusing in Multiple-Target Media" Elsevier, Vol. 20 (1994), pgs. 151-163

#### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

#### ***Claim Rejections - 35 USC § 103***

Claims 4, 21, 41 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fink (US Patent No. 5,092,336) in view of Prada (Elsevier Sciences B.V.). Fink discloses a method and device for focusing an ultrasound beam delivered by a transducer array on a reflective target in a medium. The distribution in time and the shapes of the echo signals for obtaining reversed signals are reversed and the reversed signals are applied to the respective transducers of the array (see Abstract). The method includes illuminating a zone with an initial unfocused beam. See column 2,

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lines 25-34. Each time reversal of the echo enhances the ratio between the energy reflected by the target of high reflectivity and the energy reflected or scattered by local irregularities (column 2, lines 45-48). The device comprises a transducer array, a processing channel comprising an A/D converter, memory means and a power transmitter (column 4, lines 1-9). It is possible for the device to carry out ultrasonic hyperthermia. Also, there may be a stone reflecting a beam received from an array of illumination transducers (column 2, lines 10-17). However, Fink does not describe the decomposition of the eigen-values. Prada teaches a method of decomposition of the time-reversal operator in order to provide optimal phase and amplitude laws to focus on specific targets amongst multiple targets in the field of view (see Abstract). Also see the left column of page 156 through the left column of page 158. It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate eigen analysis, as taught by Prada, in the system of Fink because each eigenvector of the time reversal operator is associated to one of the point-like targets, thereby allowing focusing on specific scatterers.

Claims 5-8, 22-25, 42-45 and 62-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fink in view of Prada as applied to claims 4, 21, 41 and 61 above, and further in view of Candy (US Patent App. 2001/0037075). Neither Fink nor Prada discuss weighting the eigenvalues. Candy teaches estimating a weighting coefficient of the  $i$ -th scatterer of the plurality of scatterers. While not explicitly stated in Candy, it is taught that the eigen-value analysis of Prada allows one of skill in the art to focus on individual scattering signals based on individual scatterers with the use of the

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eigenvalues (see page 158), thereby providing a means to apply weights, as taught by Candy. It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate eigen analysis to provide weighting, as taught by Candy, in order to reconstruct a combined total received field of weighted individual scattered fields from estimates of each of the strongest scatterers (paragraph 30).

## **NEW GROUND(S) OF REJECTION**

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 4, 21, 41 and 61 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2, 14, 29 and 44, respectively, of copending Application No. 11/904,823, in view of Prada (Elsevier Sciences B.V.). The copending application claims identical subject matter to that of the

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current application, except for claiming, "wherein said step of dynamic focusing said acoustical energy on said mass utilizes time reversal eigen-decomposition." Prada teaches a method of decomposition of the time-reversal operator in order to provide optimal phase and amplitude laws to focus on specific targets amongst multiple targets in the field of view (see Abstract). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use eigen-decomposition as the means of dynamic focusing said acoustical energy because Prada teaches that each eigenvector of the time reversal operator is associated to one of many point-like targets, thereby allowing focusing on specific scatterers.

**(10) Response to Argument**

Firstly, the Examiner notes that the Appellant failed to make any mention of the double patenting rejection, which was part of the Office Action dated August 15, 2008, at any point in the Appeal Brief. The same copending application forms the basis for the obviousness-type double patenting rejection set forth as a new ground of rejection above.

On pages 11-14, the Appellant summarizes portions of the Fink and Prada references. On the bottom of page 14, the Appellant argues that there is no *prima facie* case of obviousness and lays out three criteria for such.

On page 15, the Appellant argues, "the criterion that prior art reference, or references when combined, must teach or suggest all the claim limitations can not be met." The Appellant then states that the entireties of the independent claims are not taught by the references. The Examiner respectfully disagrees. Fink specifically states,

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“It is an object of the invention to provide a process and device for accurately focusing an ultrasonic beam on a target of high reflectivity, such as a calculus, and to provide self-adaptation of the wave front to the shape and position of the target itself, possibly for the purpose of destroying it (column 1, lines 55-60).” Therefore, Fink teaches detecting the presence of the calculus, or mass; localizing the mass; developing temporal signatures and dynamic focusing of acoustical energy. However, Fink does not specifically teach a eigen-decomposition. Prada teaches a method of decomposition of the time-reversal operator in order to provide optimal phase and amplitude laws to focus on specific targets amongst multiple targets in the field of view (see Abstract). Therefore, criterion 1, as stated by the Appellant has been met.

On page 16, the Appellant argues, “the criterion that there must be a reasonable expectation of success with the proposed combination can not be met.” The Examiner respectfully disagrees and reiterates the statement for motivation provided in the grounds of rejection: It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate eigen analysis, as taught by Prada, in the system of Fink because each eigenvector of the time reversal operator is associated to on of the point-like targets, thereby allowing focusing on specific scatterers.

On page 17, the Appellant argues, “the criterion that that Examiner must follow the ‘Examination Guidelines for Determining Obviousness in Light of Supreme Court’s KSR v. Teleflex Decision’ published October 10, 2007 can not be met. These guidelines include the requirement that the Examiner provide reasons for combining the references to produce the proposed combination.” The Examiner has provided such



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reasons and reiterates them a second time: It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate eigen analysis, as taught by Prada, in the system of Fink because each eigenvector of the time reversal operator is associated to one of the point-like targets, thereby allowing focusing on specific scatterers. The Appellant then states on page 17, "The stated reasons are not valid reasons for combining the Fink and Prada references," followed by a shortened version of the summary of the references as provided on pages 11-14 of the Appeal Brief. The Appellant fails to specifically state why these reasons are not valid and the Examiner respectfully disagrees with the argument against the validity of the motivation and combination of these references.

At the bottom of page 18 through page 19, the Appellant summarizes portions of the Candy reference. On page 20, the Appellant argues that there is no *prima facie* case of obviousness and lays out three criteria for such.

On the bottom of page 20 the Appellant argues, "The criterion that prior art reference, or references when combined, must teach or suggest all the claim limitations can not be met." Pages 21-22 then state all of the claimed subject matter for each claim that is rejected with the combination the Fink, Prada and Candy references.

Regarding claims 5, 22, 42 and 62

In paragraph 72 on page 36 of the specification it states, "The technique requires transmitting a broadband pulse from each of the N array elements in sequence, collecting and storing N received signals between each transmit. The resulting N by N array (multistatic data array) of received signals..." Similarly, Candy uses at least a one

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dimensional array of transceiver elements, however, they may also be organized into a two-dimensional array (paragraph 18). Furthermore, it would be obvious to one of skill in the art to use weights to increase the signal-to-noise ratio (SNR) because decreasing the SNR would decrease accuracy and therefore, place the patient in a potentially hazardous operation in an attempt to destroy a calculus.

Regarding claims 6-8, 23-25, 43-45 and 63-65

In paragraphs 27 and 28 of Candy, weighting is discussed. These weights are chosen so as to correspond with intermediate scatterers within the field of view. The desired pattern that the weights will fit is that of the arrangement of the scatterers. Furthermore, these weights are used to provide selection between the different scatterers, thereby minimizing errors when a particular scatterer is to be selected. The simple propagation model used is described in these paragraphs, as Candy states, "Thus, using this scattering model the total residual or difference between the noisy combined total field and the reconstructed or estimated combined total received field is defined with all scatterers removed by..."

Therefore, criterion 1, as stated by the Appellant has been met.

On the top of page 23, the Appellant argues, "The criterion that there must be a reasonable expectation of success with the proposed combination must be met. The Examiner respectfully disagrees with this argument based on the above rebuttal by the Examiner to criterion 1.

On the bottom of page 23, the Appellant argues, "The criterion that that Examiner must follow the 'Examination Guidelines for Determining Obviousness in Light of

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Supreme Court's KSR v. Teleflex Decision' published October 10, 2007 can not be met. These guidelines include the requirement that the Examiner provide reasons for combining the references to produce the proposed combination." The Examiner has provided such reasons in the Office Actions and reiterates them: While not explicitly stated in Candy, it is taught that the eigen-value analysis of Prada allows one of skill in the art to focus on individual scattering signals based on individual scatterers with the use of the eigenvalues (see page 158), thereby providing a means to apply weights, as taught by Candy. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate eigen analysis to provide weighting, as taught by Candy, in order to reconstruct a combined total received field of weighted individual scattered fields from estimates of each of the strongest scatterers (paragraph 30). The Appellant then states on page 24, "The stated reasons are not valid reasons for combining the Fink, Prada and Candy references," followed by a shortened version of the summaries of the references as previously stated in the Appeal Brief. The Appellant fails to specifically state why these reasons are not valid and the Examiner respectfully disagrees with the argument against the validity of the motivation and combination of these references.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section **(9)** above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

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Respectfully submitted,

James Kish

/James M Kish/

Examiner

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December 4, 2008

**A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:**

/DONALD HAJEC/

Director, Technology Center 3700

Conferees:

/BRIAN CASLER/

Supervisory Patent Examiner, Art Unit 3737

/Janet C. Baxter/

TC 3700 TQAS